

**Beaufort Sea Oil and Gas Development
Northstar EIS Project**

Public Scoping Meeting

Fairbanks

1996

BEAUFORT SEA OIL AND GAS DEVELOPMENT/
NORTHSTAR ENVIRONMENTAL IMPACT STATEMENT PROJECT

PUBLIC SCOPING MEETING

Thursday, March 28, 1996, 8:00 p.m.

Fairbanks, Alaska

Alaska Stenotype Reporters

Serving Alaska Since 1953
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Scoping Meeting - Fairbanks

PARTICIPANTS

BP Exploration (Alaska), Inc.:
Gary Campbell
Cindy Bailey (not present)
Peter Hanley

Dames & Moore EIS Preparation Team:
Gary Hayward
Kim Morris
Jon Isaacs
Steve Braund

LEAD AGENCY

U.S. Army Engineer District, Alaska:
Tim Jennings
Terry Carpenter

COOPERATING AGENCIES

North Slope Borough:
Tom Lohman (not present)

U.S. Environmental Protection Agency:
Ted Rockwell

U.S. Minerals Management Service:
Paul Lowry

U.S. Fish and Wildlife Service:
Lori Quakenbush (not present)

U.S. National Marine Fisheries Service:
Jeanne Hanson

Reported by: Karen Ford
Alaska Stenotype Reporters

1 Thursday, March 28, 1996, Fairbanks, Alaska, 8:00 p.m.

2

3 TIM JENNINGS: If everyone would take their
4 seats, I would like to get started.

5 Does everyone have a copy of the newsletter? We
6 may refer to this at times tonight. It would be helpful if
7 you have one of these.

8 I would like to thank you all for coming. I am
9 Tim Jennings with the Corps of Engineers.

10 The purpose of this meeting, as I believe you
11 are aware, it's the public scoping meeting for the Beaufort
12 Sea oil and gas development and the BP Northstar proposed
13 project.

14 I would like to introduce a few folks that are
15 on the agency EIS team that are here tonight.

16 Terry Carpenter is also with the Corps of
17 Engineers. Terry is the project manager for the Corps on
18 this project. You will see her name printed on the
19 literature and on the comment card, and if you call the 800
20 number, you will be talking to Terry most likely about the
21 project. If not, you can ask for me.

22 Also here tonight is Paul Lowry from Minerals
23 Management Service. This project potentially -- well, it
24 would involve two federal leases, so Minerals Management
25 Service is in charge of the OCS, the outer continental

1 shelf, and they represent some of that federal interest.
2 Also here from the Environmental Protection Agency is Ted
3 Rockwell. From National Marine Fisheries Service is Jeanne
4 Hanson. Also on the Environmental Impact Statement or the
5 EIS team is the Fish and Wildlife Service. There is a
6 representative -- not here tonight -- Lori Quakenbush. And
7 the last agency team member is the North Slope Borough.
8 And because of some logistical problems we had on the
9 Slope -- we were weathered in in Kaktovik yesterday in a
10 ground blizzard -- our North Slope Borough representative
11 is not here tonight, and that person is Tom Lohman.

12 So the purpose of the meeting, as I mentioned,
13 is to obtain public comment, public input into the scoping
14 process for the EIS. And if you will look just for a
15 minute at this newsletter, on the third page there are the
16 steps to the EIS process. Then the little hand tells you
17 where we are in the process. We are right at the
18 beginning. And the public scoping process is meant to help
19 the agencies frame the key issues that we will carry
20 forward into the EIS process.

21 So that is primarily what we are looking for
22 from interested parties tonight, is what kind of
23 alternatives should we be looking at, what kind of
24 mitigation measures, what are reasonable options for
25 construction and operation to help us carry issues forward.

1 If there are major unresolved issues, those issues and
2 concerns, they get carried forward in the EIS process.

3 The format of tonight's meeting is meant to be
4 informal. There are relatively few of you here. I don't
5 know how many of you are going to actually want to speak
6 and give us input. At this point in time I won't set time
7 limits on you. We would like to afford everybody the
8 opportunity to speak and say what the issues are. If we
9 start to get real late, we might ask people to try to limit
10 and summarize their comments.

11 The format of the meeting is -- we have a
12 third-party contractor preparing the EIS for us, the
13 agencies, and they are headed by Dames & Moore. And Gary
14 Hayward here to my right is the project manager for Dames &
15 Moore. Also here tonight at the head table is BP
16 representative Gary Campbell. We will start out the
17 meeting with a brief conceptual overview of BP's proposed
18 Northstar project, and Gary will go through some of the
19 design options and considerations they are looking at
20 presently. That will be followed by Gary Hayward, who will
21 describe some of the EIS process, the public involvement,
22 where we are in the process and how the process will
23 follow, what comes next. And then we will ask to hear from
24 you. It's meant to be informal. There can be a dialogue.
25 If you want to ask questions for clarification, that's

1 fine. We will just see how it goes.

2 So we will start first with Gary Campbell with
3 the conceptual overview of BP's Northstar project.

4 GARY CAMPBELL: Thank you for coming tonight,
5 first and foremost. It's nice to see so many people out.
6 I was here last summer, I think with Badami, doing some
7 similar type public meetings and we had three people show
8 up. So we have exceeded my expectations tonight.

9 Again, thank you for being here. BP is very
10 interested in following and going forward with the
11 Northstar project. As most of you are aware, production is
12 declining on the existing fields in the North Slope and we
13 see it as an advantage to everybody if we can get
14 additional production on-line. It helps to keep TAPS
15 filled and keep the state revenues high.

16 Northstar project development is an offshore --
17 it will be the first offshore development on the Beaufort.
18 Endicott is also an offshore development; however, it is
19 connected to land by a full causeway. We don't anticipate
20 that the Northstar development would have any kind of a
21 causeway. It's on state leases as well as two federal
22 leases, so the unit -- this will also be the first time
23 that the federal leases have been in production on the
24 North Slope, and it's also within the North Slope Borough
25 tax jurisdiction.

1 Most of you are probably familiar, but the
2 formation has effectively been delineated by wells drilled
3 from Seal Island to Northstar Island, originally owned by
4 Shell and Amerada Hess. A lot of that drilling was done in
5 the early to mid '80s. .

6 There are several key issues that surround the
7 designing. The first one I would like to talk about is
8 structures. The CIDS also was used up there -- concrete
9 island drilling structure -- brought in by Global Marine.
10 It was used for one or two of the wells. Seal Island and
11 Northstar Island were temporary islands built for
12 exploration. All wells to date have been plugged and
13 abandoned. Molikpaq is another drilling structure that
14 could be used. It's currently in the waters in the
15 Canadian Beaufort. There are also several others, like a
16 caisson-retained island. There is the SSDC. There are
17 several structures that we are looking at in addition to
18 expanding the Seal Island location to something in the
19 order of five acres for the production and drilling
20 facilities.

21 In terms of facility location, that is another
22 key issue. There are two ways I would categorize the
23 facilities, and that is onshore versus offshore, or some
24 combination of each. The alternatives we looked at ran the
25 full gamut of bringing three-phase production onshore to an

1 existing facility at PBU or Lisburne to full processing
2 offshore. That will ultimately mean, if the project goes
3 forward, that there will probably be some combination of
4 existing facilities used as well as new facilities used, or
5 the potential of even all new facilities. It's going to
6 depend on what makes sense for the project. We are
7 currently looking at approximately 50,000 barrels of oil
8 per day production from the Northstar project.

9 Another key issue for design is pipelines. We
10 are currently looking at two pipelines going from the
11 mainland to the structure. One would be a 12-inch pipeline
12 bringing oil back. And I might back up a little bit here.
13 We have a test case that we are using as kind of a base
14 case, but it's really a test case because we don't have a
15 definitive preferred option, and that includes full
16 production on the structure offshore, a 12-inch pipeline
17 bringing the production onshore, snaking through until it
18 gets to Pump Station 1, and a gas line going back to serve
19 as a fuel line during initial start-up and also to
20 transport NGLs for enhanced oil recovery later on in the
21 project.

22 Some of the routes that we have looked at -- I
23 might just use this map, it's probably as good as any.
24 From a location close to or on Seal Island we have looked
25 at coming to the west along the barrier islands in to Back

1 Point or Beechy Point, using Milne Point facilities as one
2 of the alternatives. We have also looked at going straight
3 in through Point Storkersen, tying in with the Prudhoe or
4 Lisburne facilities. We have looked at coming in to West
5 Dock -- in fact there are a couple of different
6 alternatives. One coming in close to Stump Island and
7 doglegging over to West Dock or straight over to West Dock,
8 again tying into the existing infrastructure. We have
9 looked at alternatives of going over to Endicott and tying
10 into the Endicott facilities at the end of the causeway.

11 So it is pretty much open at this point. There
12 is a lot of work to be done, in particular the results of
13 these scoping meetings in terms of helping us with further
14 design.

15 Some of the construction techniques -- I was
16 able to talk with some of you a little bit about our test
17 trench program that we have just completed on the North
18 Slope along one of the pipeline routes. We actually did
19 some trenching inside the barrier islands where we added
20 water and ice to the top of the existing ice to drive it
21 down and freeze to the seabed, cut out ice cubes, if you
22 will, and then just with a backhoe trench down to test
23 soils. We did a similar thing outside of the barrier
24 islands, in fact just north of Stump Island, where we cut a
25 slot in the ice and with a backhoe reached down again and

1 dug a trench there. The whole idea was to determine
2 trenching techniques for pipe laying. And most of you, I
3 think, have taken a look at our artist's conceptions of how
4 we think it would all take place.

5 The pipeline is currently planned to be buried
6 at a 10-foot depth. Ice gouging in the 40-foot water depth
7 has been measured as high as two feet, typically in the
8 one-foot range, so that gives it a pretty good safety
9 factor, if you will, built in.

10 The status of engineering, conceptual
11 engineering, is effectively complete. Conceptual
12 engineering is the step where we effectively come up with
13 all of the ideas, all of the possible alternatives. That
14 is why you hear us talking about several alternatives
15 instead of one.

16 We are starting on what we call preliminary
17 engineering where we are trying to narrow down what are the
18 preferred options, the best way to go. And at this time we
19 are actually trying to get in sync more with the EIS
20 process, which also looks at alternatives from an
21 environmental and permitting point of view. So sometimes
22 it seems like we are a step ahead of the EIS or a step
23 behind, but we are trying to work in parallel as best we
24 can to take advantage of the information that we gain,
25 particularly from the scoping meetings here.

1 A couple of design features that we have already
2 got into our design criteria were based on some meetings
3 that we had last year in Nuiqsut. There are no gravel bags
4 for slope protection. We have effectively taken that out
5 of our consideration. Slope protection on an island
6 structure, if we go to that, would be concrete matting
7 similar to Endicott.

8 Another design criteria that was of interest to
9 the village of Nuiqsut was noise, primarily for their
10 whaling season, so we are looking at all of the low-noise
11 impact equipment as well as insulation for noise
12 suppression.

13 From a permitting point of view, we have not
14 applied for any major permits and we will not be until
15 after scoping and additional engineering work is complete.

16 So there is not much more I can say on the
17 project at this point. There is a lot of work still to be
18 done. The one thing I will say is BP -- as Ted Rockwell
19 pointed out a couple of times, BP is acting as a
20 cooperating applicant. We believe the EIS is a necessary
21 and a purposeful part of the project and we are fully
22 cooperating in helping get that done.

23 That's about it for me.

24 GARY HAYWARD: As Tim had mentioned, my name is
25 Gary Hayward and I'm with Dames & Moore's Anchorage office

1 and the project manager for this EIS.

2 And in addition to Dames & Moore and the
3 agencies and BP, we have got a few experts assembled with
4 us. We have Jon Isaacs from Jon Isaacs & Associates in the
5 back; Steve Braund from Steve Braund & Associates doing
6 some subsistence work and Native issues work. We have a
7 gentleman from Cornell University, who is an expert in
8 marine mammals and acoustics, who will be working with us
9 as well.

10 And again, as Tim said, we are in the very early
11 stage of the EIS process. It's the beginning of the NEPA
12 process. We may not have all your answers here tonight.
13 The design is still progressing as we are progressing. But
14 we are here to solicit your comments and to take your
15 comments into consideration and have them addressed in the
16 EIS.

17 It's important to note that this is the first
18 offshore oil and gas development in the Beaufort. And
19 unlike exploration activities that have gone on in the
20 past, there is a whole set of issues inherent in the
21 development that is separate again from the exploratory
22 phase. And that includes, among others, year-round
23 operations, that includes some means of transport of oil to
24 shore, and it includes vessel traffic, helicopter traffic
25 and other things that are going to occur on a year-round

1 basis.

2 One of our purposes, or one of our goals in this
3 project is to develop an EIS that is a little bit different
4 in format and a little bit different in structure than
5 previous EISs, the point being that maybe we can make this
6 a little bit more user-friendly, a little bit more
7 informative to the public and to the North Slope village
8 folks in particular. And we are making every effort to
9 incorporate and utilize traditional Native knowledge and
10 experience in the EIS process and apply it to various
11 aspects of the project.

12 Throughout this week so far we have had meetings
13 in Barrow and in Kaktovik. We were scheduled for Nuiqsut
14 and got weathered out. We will be going back to Nuiqsut.
15 We are here tonight. We have scoping meetings in Valdez
16 and in Anchorage still to come. There will be agency
17 meetings over the next few weeks.

18 There will also be a series of follow-up
19 newsletters to follow on throughout the process prior to
20 the issuance of the draft EIS, as well as probably at the
21 end of the scoping process, to let everybody know where we
22 are, what has come out of the scoping process and what we
23 are going to be going forward with in the draft EIS.

24 The schedule to date for the whole process is a
25 bit fluid. We are striving to get a draft out sometime in

1 the fall, late fall perhaps.

2 And we are here tonight to take your comments
3 and we look forward to having you stand up and hear what
4 your concerns and issues are.

5 I'll turn this back over to Tim here now.

6 TIM JENNINGS: I have a couple more remarks
7 before we get started with a bit of more dialogue and to
8 hear your comments and concerns.

9 I want to explain for you how the agencies view
10 the process. There may be some -- I just want to make it
11 clear that the agencies and the EIS team, we are neutral.
12 We are neither proponents of the project nor are we against
13 the project.

14 The EIS process helps us frame the key questions
15 and issues, and it's a public disclosure process which is
16 intended to help the decisionmakers from the federal
17 perspective and the North Slope Borough as a cooperating
18 agency make the best decisions available at the end of the
19 process. That's one point.

20 It is also a rather unique EIS in Alaska and on
21 the North Slope in that -- two things, Gary mentioned we
22 are really focusing to incorporate traditional knowledge
23 from the Native people. They have a lot of information
24 over the generations regarding whaling, for instance, and
25 whale behavior. The other distinction is that this is the

1 first EIS process that the North Slope Borough is a
2 cooperating agency with the federal agencies.

3 We have a court reporter here tonight, Karen,
4 who is helping us with a record that we can take back and
5 summarize key issues and concerns. When you comment, if
6 you would be so kind to state your name and speak loudly
7 and clearly enough so that Karen can keep track of things.
8 We also have a tape recorder going in terms of she can
9 double-check the tape later on in terms of what she is
10 taking down. So if you would give your name and by way of
11 background any information that you think is important for
12 us to know about you or who you represent, and then talk
13 about the issues that are of concern to you.

14 We also think that -- BP has come to us as an
15 applicant with the Northstar project. Because it is
16 potentially very precedent-setting in that it has a subsea
17 pipeline proposal, it's offshore and federal leases, two
18 federal leases involved, this is having the agencies in
19 this process look more broadly at oil and gas development
20 in the Beaufort Sea. This could lead to additional subsea
21 pipelines if the technology is done and proven.

22 And so we will ask two things from you, if you
23 have them, for comments. One is on BP's Northstar project
24 very specifically, and then a broader context of oil and
25 gas development in the Beaufort Sea. One of the maps up

1 here tonight is currently-held leases by the oil industry,
2 and this can give us all some indication of where the
3 current interest is for oil exploration and potential
4 development. Nobody at this point in time can confirm
5 where the next one is going to be offshore, we are not even
6 close to that point yet, but there is a larger context that
7 we are also looking for.

8 Okay. With that, it's informal. If you would
9 like to stay seated, if you would like to stand, it's your
10 option. Just speak loudly enough that we can hear you, and
11 we'll open it up to any concerns or comments regarding the
12 topic of the night.

13 The lady in the back, you had your hand up
14 first.

15 KAREN TOLAND: Well, this probably doesn't
16 pertain to your topic, but I would just like to straighten
17 something out for myself.

18 I am Karen Toland, P. O. Box 81993, 99708.

19 TIM JENNINGS: Karen Toland?

20 KAREN TOLAND: Yes, T-o-l-a-n-d.

21 I am somewhat ignorant of this whole EIS process
22 and I just want to straighten out for myself just exactly
23 what you mean. And now we are assuming -- I hate to assume
24 anything. This project is not a given, is that what I am
25 understanding? If you had enough public opposition to it

1 for any reason, this project would not go through. Is that
2 right?

3 TIM JENNINGS: It's not a given from a couple
4 perspectives.

5 KAREN TOLAND: Okay, from what? That would be
6 one perspective.

7 TIM JENNINGS: There is no given, even from BP's
8 perspective, that this is a go of a project. They are
9 still in the conceptual design part of it. And, Gary,
10 chime in if I am misstating BP's perspective. Economics
11 could change. Other things can affect an applicant's
12 decision.

13 Your point from the agencies' position is
14 correct. The agencies have not made a decision. The
15 permit decision comes at the very end on that Page 3. The
16 agencies at this point in time -- one of the alternatives
17 that is carried forward in the EIS process is the no-action
18 alternative.

19 KAREN TOLAND: Is this the first public
20 commentary allowed on this particular project in the
21 Fairbanks area? Have I missed any?

22 TIM JENNINGS: No. It's the first public
23 meeting on this project, on the Northstar project.

24 GARY HAYWARD: I might add, too, that the EIS
25 document will be used as a tool by the agencies to evaluate

1 the project and for them to evaluate in how they issue
2 their permits and if they issue the permits and things like
3 that. It is not a document that puts a stamp of approval
4 on a project.

5 TIM JENNINGS: To clarify that -- I see some
6 troubled looks. An EIS document itself is a full
7 disclosure document of the key issues and concerns that are
8 raised during the process, the scoping process that we are
9 in early. The EIS itself does not come to any conclusion
10 in terms of whether to issue permits or not. Those are
11 separate decisions. The EIS document is meant to give
12 decisionmakers the best available information regarding the
13 project, economics, impacts on natural resources,
14 engineering designs, subsea pipeline design, oil spill,
15 those sorts of issues, for instance.

16 KAREN TOLAND: Just to further it along, who
17 ultimately is the decision-making body after we finish this
18 process?

19 TIM JENNINGS: There are several decisionmakers.
20 It would be in the -- from the federal perspective there
21 are several agencies that may have permits involved. The
22 Corps of Engineers, whom I represent and Terry represents,
23 we are the lead federal agency. We have a permit decision
24 to make at the end of the process.

25 At this point in time it may not be -- because

1 the design is still conceptual, we may not know, for
2 instance, if EPA will have a permit to issue or to decide,
3 make a permit decision.

4 I don't know, Paul, if you have a decision at
5 MMS.

6 PAUL LOWRY: If something falls on the federal
7 leases, we do. But there are five state and two federal so
8 I am not sure how it will fall out.

9 TIM JENNINGS: And, Jeanne, from the National
10 Marine Fisheries perspective?

11 JEANNE HANSON: There is certain authorization
12 depending on what happens with regards to marine mammals.

13 TIM JENNINGS: The North Slope Borough would
14 need to make a decision on the North Slope Borough
15 development or land use permit, and there are several state
16 agencies that will make permit decisions.

17 GARY HAYWARD: In fact one of the sections in
18 the EIS will outline all the permits that are going to be
19 required for this project, that the EIS will be a basis for
20 them to help make their decisions on.

21 DAVID VAN DEN BERG: That the EIS will be a
22 resource all agencies can use --

23 GARY HAYWARD: And the public.

24 DAVID VAN DEN BERG: -- to justify the granting
25 of the permits.

1 TIM JENNINGS: It is meant to give the
2 decisionmakers the best available information to make their
3 decisions, correct.

4 Yes, sir.

5 STEVE FORTELNY: My name is Steve Fortelny, and
6 I am just here as kind of a concerned person. I guess it's
7 kind of exciting for me to see that there is potentially
8 more action up there.

9 My questions, I guess, have to do with the
10 engineering aspect of it. Who approves the engineering of
11 this particular line, because there are going to be new
12 things happening here that maybe haven't been done before?
13 Which -- what agency or company or who is it that --

14 GARY HAYWARD: Well, the applicant in this case
15 is putting together a conceptual design, which would evolve
16 to a preliminary design as the process goes forward. The
17 EIS will take into account their design, various
18 environmental factors, and -- take the pipeline for
19 discussion here as it relates to burial depth, as it
20 relates to wall thickness, as it relates to leak detection
21 systems, as it relates to where valves are placed and
22 things likes that -- and analyze that in the context of
23 various disciplines discussed in the EIS. And
24 conclusions -- or conclusion is not the right word. But
25 judgments can be made as to the overall integrity of the

1 system from the environmental perspective. It is not an
2 approval process by any stretch of the imagination. I
3 guess actually the Joint Pipeline Office probably has the
4 final approval on the pipeline.

5 TIM JENNINGS: There is a joint federal and
6 state pipeline office headquartered in Anchorage, and they
7 would have some direct approval process -- correct, Gary --
8 on the pipeline design itself.

9 GARY CAMPBELL: Yes. On the pipeline design,
10 effectively they would be responsible for granting or not
11 granting the right-of-way lease to put the pipe on. We
12 have all industry applicable standards to follow, like API
13 and ASME. We would also have to fall under Department of
14 Transportation, DOT regulations in terms of specifications,
15 design criteria, et cetera, et cetera, so...

16 TIM JENNINGS: And can you explain what the two
17 acronyms are, API and ASME.

18 GARY CAMPBELL: Oh, American Petroleum Institute
19 and the American Society of Mechanical Engineers. It's
20 kind of the standards for the oil industry in terms of they
21 have specifications as to how to design pipe that has been
22 proven and accepted kind of on a petroleum industry-wide
23 basis. There is also -- recently API has gone through
24 arctic or cold weather type specs. We would be following
25 them also. N2 specs I think they are called.

1 There are industry standards within BP. Because
2 of our desire to maintain safety records and our good
3 standing in communities, we also have our internal specs
4 and performance guidelines that we would also be adhering
5 to, and for the most part those are typically more
6 stringent than the basic industry standards.

7 STEVE FORTELNY: The reason I am asking is I
8 have some concerns over the corrosion aspects. I know that
9 you can engineer a thing until you are done engineering it,
10 but there are going to be unforeseen things happening. And
11 I know from my personal experience there has been some
12 corrosion problems and replacements of pipes. And I am
13 just hoping, and I want to go on record as to voice my
14 concern that these, the corrosion problems have been looked
15 at thoroughly enough for the life of the pipeline in that
16 buried application.

17 TIM JENNINGS: From our agency perspective in
18 this process, we don't design a project for the applicant.
19 They come to us with the design. We will look at the
20 design for sufficiency and adequacy. In terms of your
21 specific stated concern, the joint federal and state
22 pipeline office has the expertise, the technical expertise
23 on the pipeline design, and that will be primarily their,
24 from an agency perspective, their review on that issue.

25 STEVE FORTELNY: Well, I have seen a 24-inch

1 pipeline that is less than five years old, about a half
2 inch thick, corroded the entire length of it, about two
3 inches wide all along the base of it. And this has to do,
4 as I was talking with Gary, about when they inject seawater
5 into the field, the microorganisms, as they survive within
6 that oil pumping through the line, they excrete something
7 in their little body that actually -- it's just like a
8 piece of rotten wood. And this is in a pipeline that is
9 less than five years old. I would hope that your engineers
10 would be on top of that, needless to say.

11 GARY CAMPBELL: Just a minor comment, because I
12 don't have the answers for you tonight.

13 STEVE FORTELNY: Yes, I'm sure, and I don't want
14 to put you on the spot, you know.

15 GARY CAMPBELL: We have started discussions with
16 the Joint Pipeline Office, and we are fortunate that
17 Alyeska has been willing to talk with us as well, so we are
18 leveraging as much knowledge as we can, specifically arctic
19 and Alaskan knowledge, on issues exactly like that, so that
20 that information is incorporated into our design from day
21 one and not something that we forgot about or should have
22 thought about later type of thing. We have had, I guess,
23 two meetings with Alyeska people, and in particular a
24 couple of their corrosion experts, and they have helped us
25 tremendously in terms of our approach to the pipelines.

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1 Excellent comments, and I have written it down
2 here, too, because I want to make sure that we follow up.

3 STEVE FORTELNY: You did mention that the
4 outside of the pipe was to be coated?

5 GARY CAMPBELL: Yes. Fused and bonded epoxy
6 would be the typical outside coating. So it would be
7 coated, yes.

8 STEVE FORTELNY: And then the tie-in welds on
9 the pipe, they would be coated on-site before lowering
10 down?

11 GARY CAMPBELL: Yes, we would have a shack
12 around the welding equipment and so on, and the pipe
13 preheated for the welding, particularly because all welding
14 would have to go to certain specs, and then coating -- once
15 everything is heated up, all the coating and checking
16 quality, QA, QC.

17 STEVE FORTELNY: So there would be a pig run
18 through it before you dropped it down?

19 GARY CAMPBELL: Probably -- yes, they usually
20 run what they call a drift through it to verify the inside
21 diameter and not give it any slag or anything that might
22 have bonded to it. And when it goes into operation, it
23 will be pigged before it goes into operation, for several
24 reasons.

25 Is everybody familiar with pigging? I mean I

1 know it sounds strange to somebody that hasn't been around
2 pipelines, I'm sure, but...

3 TIM JENNINGS: 'One thing, Gary, that you
4 described in one of the meetings was -- I don't know if it
5 was the pig, geo-pig?

6 GARY CAMPBELL: Yes, geo-pig.

7 One of the systems that we have -- and those of
8 you who are familiar with TAPS already are aware of the
9 NOWSCO geo-pig. It effectively, in layman's terms, can
10 give you longitude, latitude and elevation, if you will.
11 So you run this geo-pig through the line and it will define
12 where in space that pipeline is. So if you use that as the
13 base, the first run, if you will, any subsequent runs you
14 can compare where that pipeline is and detect where the
15 pipeline may have settled or shifted or where there is some
16 additional stress points along the pipeline.

17 We see that as a very valuable tool for our
18 pipeline in terms of monitoring and prevention. So if we
19 detect some stresses that are getting close to beyond
20 design specs, we can actually react and do something, purge
21 the line out, repair it, work around it, do whatever we
22 need to do to insure its integrity and put it back in
23 service. That, in addition to the electronic pig, which
24 most of you are probably familiar with, to measure wall
25 thickness, check for pits, corrosion, that kind of thing.

1 So both of those devices are going to be an integral part
2 of our design.

3 TIM JENNINGS: Sir, did you want to continue?
4 In the back, are you -- there is an opportunity later on as
5 well.

6 STEVE FORTELNY: Did you answer -- did you not
7 say that the line was going to be 20 years old?

8 GARY CAMPBELL: We are looking at a project life
9 of about 20 years, what we see now. Now, they also said
10 that for TAPS 20 years ago, so...

11 STEVE FORTELNY: Yeah. They were a little under
12 on the bid, too.

13 What would be done with that line when the
14 island was finished with its useful life?

15 GARY CAMPBELL: I don't know the right answer.
16 I would assume it would be purged with some inert material
17 and left in place rather than removed. But that is a
18 decision typically that is made at that point in time
19 rather than prebuilt into it.

20 It has gone both ways, I think, with the Joint
21 Pipeline Office and the right-of-way leases, that
22 abandonment is part of the initial approval. In a lot of
23 cases abandonment is a decision made at that time, when
24 it's time to abandon what is the best thing to do, because
25 the issue you get into is whether you are going to do more

1 destruction to the environment by removing it than if you
2 were to just make it inert and leave it there.

3 GARY HAYWARD: Plus a lot of technologies can
4 change over the 20 next years, too, which will play into
5 that decision at that time.

6 STEVE FORTELNY: You mentioned that one line
7 going back to the island was for natural gas for the
8 construction phase and then after that point would be used
9 for, and then I didn't catch what --

10 GARY CAMPBELL: Natural gas liquids, MIs,
11 miscible injectants, supplied for enhanced oil recovery.

12 STEVE FORTELNY: Is that something they use that
13 they pump into the well that would bring pressure up?

14 GARY CAMPBELL: Yes, pressure up, and it also
15 interacts with the oil to help increase recovery factors.
16 Yes. That is fairly typical. It happens at Kuparuk and
17 Endicott.

18 STEVE FORTELNY: So there wouldn't be seawater
19 injection on this island that you know of at this point?

20 GARY CAMPBELL: They are looking at both. For
21 me to say that they are going to do water injection or MI
22 or a combination, we don't know the right answer yet. We
23 are still working on the depletion plan; we have what we
24 call the reservoir engineering geologist working on it. We
25 feel pretty confident with the success that NGLs and MI

1 have had, that that will be a part of the depletion plan,
2 so we are planning for that in terms of the pipeline. I
3 would suspect waterflood would also be a part of that. The
4 source of that water, I don't know, and I don't know
5 whether water would be used yet or not. So at this point
6 we are really -- we still have quite a few options rather
7 than...

8 TIM JENNINGS: Yes, sir.

9 DAVID VAN DEN BERG: It says that the -- in the
10 newsletter that the agencies make permitting decisions.

11 My name is David van den Berg, Box 80433,
12 Fairbanks.

13 And I just wondered where along the line would,
14 could BP present its first permit. This is where they make
15 the decision at the end, but where along the line can you
16 actually advance your first permit to present it to the
17 agencies?

18 TIM JENNINGS: They can actually submit a permit
19 application to us or other agencies, like other state
20 agencies that I mentioned, at any time.

21 GARY CAMPBELL: We have a desire to get past the
22 scoping meetings and to have as much in concert with the
23 EIS process as possible in terms of submitting applications
24 for permits. At the same time there is a desire in our
25 case, from our point of view, to have things run parallel

1 when that is feasible, so that when the EIS is complete and
2 the agencies have the information to help them make
3 decisions, they also know what it is that they are deciding
4 about because they have a permit application that asks for
5 something. So that is why I mentioned earlier when I was
6 talking, sometimes it seems like we are a step ahead and
7 sometimes we are a step behind. We are really trying to
8 work cooperatively and in parallel as much as possible.

9 ROBERT CACY: I would like to take a crack at it
10 and just ask you a couple of questions if I may. My name
11 is Robert Cacy, and I am just a private citizen.

12 I don't see a lot on the maps for design here,
13 and I am just kind of wondering how far along you are and
14 how much more design is going in here. And so one question
15 I would say is what about subsidence issues on the pipeline
16 between the island and the mainland. Have you addressed
17 them and do you have some answers?

18 GARY CAMPBELL: I don't have answers. The test
19 trench work that was going on this last couple of weeks as
20 well as a few test borings that we took in February of this
21 year are all going to be part of that whole process of
22 answering those kinds of questions. So I don't have
23 answers for you, but we have looked at that, we have
24 hydrologists and we have geo-tech people working on our
25 engineering design team that will be working on those

1 issues over the next two or three months.

2 ROBERT CACY: Do you have a depth of the
3 permafrost?

4 GARY CAMPBELL: Most of the geo-tech borings
5 were down, I think, in the order of 50 to 60 feet and there
6 is no permafrost. Typically as soon as you step offshore
7 there is very little permafrost. It goes down pretty
8 quickly. The test trenches I don't believe encountered any
9 permafrost as well, either inside Stump Island or outside
10 in the ocean test.

11 ROBERT CACY: And what is the material, say, ten
12 feet below the bottom of the ocean?

13 GARY CAMPBELL: What the test trench -- what
14 they were digging up with the test trench was, inside the
15 barrier islands it was primarily silt, outside the barrier
16 islands it was a combination of silt and sand. And that is
17 consistent with the geo-tech borings that we had taken
18 earlier down to 50 to 60 feet at various spots across the
19 North Slope there on the potential pipeline.

20 ROBERT CACY: Is the movement of the pipe
21 allowed for as you do on land by changing direction or by
22 the flex joints?

23 GARY CAMPBELL: No flex joints are designed into
24 it right now. That is active discussion. For the most
25 part the ends of the pipeline have space where they can

1 move, so that has been built into it. The exact design as
2 to what we would propose we haven't determined yet.

3 ROBERT CACY: You mentioned coatings on the
4 pipe. Maybe I misunderstood, but I thought you said
5 coating on the inside of the pipe?

6 GARY CAMPBELL: No. We are not planning on any
7 coating on the inside. If I said that, I misrepresented
8 myself. I meant fused and bonded epoxy on the outside is
9 what we are looking at now. In fact, we had a piece of
10 pipe up there this last couple of weeks during the test
11 trenching and we are dragging it around on top of the ice,
12 similar to how -- I shouldn't say dragging it around -- but
13 handling it, moving it around the same as we would in the
14 pipe-laying process, just to see how it reacted and how the
15 coating stood up, what kind of field repairs we would need
16 to do, that kind of thing. We want to get some hands-on
17 working experience with the pipe and the coating.

18 ROBERT CACY: Once the pipeline trench is dug --
19 and I think there was a mention of the pipeline would be
20 buried ten feet on the bottom of the sea. How do you
21 propose to dig the trench for the pipeline?

22 GARY CAMPBELL: Primarily backhoe. Inside the
23 barrier islands, as some of those artist's conception
24 pictures at the back, and the test trench has pretty much
25 verified it, too, after building ice on top of the

1 naturally-occurring ice and driving it down to the seabed
2 so that you have essentially a dry trench, they actually
3 dug out ice cubes and were able to backhoe and dig
4 conventionally like on land. They are proposing the same
5 process offshore except it will be from ice with
6 extended-reach backhoes and digging up.

7 ROBERT CACY: That was my next question. How
8 will you be able to reach that depth?

9 GARY CAMPBELL: They will have to go from like
10 four-yard buckets to one-yard buckets the farther out they
11 get with the longer-reach arm because of the counterbalance
12 and the weight issue and so on. But right now that is what
13 they were testing, and I would assume that's what they may
14 propose. I mean I'm part of that, but there is a whole
15 team of pipeline designers working. I mean we have looked
16 at jet sleds and stuff like that, which I am sure you are
17 familiar with.

18 ROBERT CACY: And then, of course, backfill as I
19 see up there is going to come from shore someplace?

20 GARY CAMPBELL: Yes.

21 ROBERT CACY: I guess my other question is the
22 design life is 20 years and not 30?

23 GARY CAMPBELL: Probably the design life will be
24 the 30 years. What I was trying to answer before is we
25 expect the project life reserve-wise to last about 20

1 years. Typically the design though is in the 30-year range
2 rather than time it for 20. We are certainly not going to
3 downgrade specs or standards just to make it 20 years.

4 ROBERT CACY: You have got a natural gas line in
5 there alongside of it. Now, which way is the natural gas
6 going to run? Is it going to run to shore or is it going
7 to run back to the island?

8 GARY CAMPBELL: The way the depletion currently
9 works is that the gas would go from the mainland to the
10 island for fuel early on, for drilling, for start-up, et
11 cetera. Our anticipation is that that would turn into a
12 product line, the NGL products line to be used offshore for
13 enhanced oil recovery. That is not to say that at some
14 point in the life of the project gas couldn't come from
15 Seal Island or Northstar, or whatever we call it, whatever
16 structure it is, back to shore. But right now the plan
17 that we are looking at would take the gas from the mainland
18 to the offshore structure.

19 ROBERT CACY: And there is not an existing well
20 at this point on the island?

21 GARY CAMPBELL: No. All the wells that -- all
22 the exploration and appraisal wells have been plugged and
23 abandoned.

24 ROBERT CACY: Okay. There were some exploration
25 wells on the island?

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1 GARY CAMPBELL: Yes.

2 TIM JENNINGS: The leases were previously held
3 by Amerada Hess --

4 GARY CAMPBELL: Amerada Hess and Shell.

5 ROBERT CACY: So BP did not do the current --

6 GARY CAMPBELL: No.

7 ROBERT CACY: So is that information available
8 to you?

9 GARY CAMPBELL: Yes. When we purchased it about
10 a year and a little bit ago, it was January '95, we also
11 purchased the data, any design that they had done at that
12 point, which Parsons Engineering had done quite a bit of
13 the design work on. We have purchased that as well as core
14 data, DST data, logs, the whole nine yards. Yes.

15 GARY HAYWARD: And from that standpoint they
16 also have all their environmental data which is available
17 to us.

18 ROBERT CACY: I believe that is all the
19 questions I have. Thank you.

20 GARY CAMPBELL: Thanks, Bob.

21 TIM JENNINGS: Thank you, Mr. Cacy.

22 DON LOWELL: I have a question. My name is Don
23 Lowell. I am with the Department of Transportation.

24 And if you look at the map up there, the oil
25 leases go across the North Slope there. And there has been

1 a lot of planning for animals and birds and protection of
2 the environment, but there hasn't been any planning for
3 public access to one of our major oceans.

4 The highway that goes up to the North Slope, the
5 Dalton Highway, is the only highway on the North American
6 Continent that could provide access to the Arctic Ocean for
7 the public, and the public has a constitutional right to go
8 up there. And I am asking at this point, is planning being
9 done to lessen the impact to public access to the north
10 shore?

11 GARY CAMPBELL: I certainly don't have an
12 answer. Pure and simple, I don't have an answer.

13 TIM JENNINGS: What I can tell you about the
14 land status, as you probably already know up there, at
15 least onshore, is that the leases are state-owned leases
16 and there are state permits involved for building roads, et
17 cetera, by the oil companies. It's in that lease process,
18 my understanding, how the state will make decisions through
19 the Division of Natural Resources, Division of Lands and
20 Division of Oil and Gas in terms of public access and what
21 becomes a public road and what doesn't. That is my limited
22 understanding of the public access question.

23 DON LOWELL: At the time that those leases were
24 issued, the entire Dalton Highway from the Yukon Bridge to
25 the North Slope was closed to all but industry, residents

1 and suppliers, businesses. And of course it is not the
2 case now, and yet in trying to work with BP and ARCO in
3 opening that highway to public access, we get a hostile
4 reception on that. And I would hope that any planning now,
5 that any facilities or any pipelines or anything else would
6 be designed not to impact ~~access to the~~ Arctic Ocean.

7 GARY CAMPBELL: Can I comment? It may or may
8 not be appropriate, so, Tim, guide me here a little bit.

9 We cannot deny access. I was manager of BP's
10 coordination a few years back and I wrestled with that
11 particular issue. We cannot deny access. I believe what
12 BP and ARCO or any prudent operator has the obligation to
13 do is protect the public, so there have been times where we
14 have maybe not allowed access at a particular hour or day
15 because of whatever activity may have been going on on the
16 roads within Prudhoe Bay, et cetera. So I don't think we
17 have any intent of denying access as much as protecting
18 people from themselves, which is maybe an overstatement.
19 But we certainly have the obligation to protect not only
20 our own workers and the land, but any public that would
21 access or come to the facilities.

22 Now, for Northstar itself, I am not aware of any
23 particular roads that we are planning. A lot of the
24 pipeline right-of-way, it would be pipelines only, no road
25 associated with it. So in terms of additional public

1 access, right now I don't think that would be an issue.
2 However, I have written down your comments here because
3 it's something I want to take back as the project
4 progresses.

5 DON LOWELL: Well, we would appreciate it if we
6 could find some folks that would be willing to sit down to
7 resolve the issues rather than saying arbitrarily that the
8 risks are too great and make statements that really don't
9 stand up.

10 GARY CAMPBELL: Yes. I am not the appropriate
11 party.

12 DON LOWELL: You can pass the message on.

13 GARY CAMPBELL: Yes, I can pass the message on
14 to our people in the headquarters in Anchorage.

15 GARY HAYWARD: I would like to add something in
16 there, too.

17 The EIS will be addressing some issues that
18 touch to that a little bit perhaps. There will be a
19 discussion of recreation and recreational uses. There will
20 be a discussion of land use and land uses, and there will
21 also be a discussion of whether or not it relates to visual
22 and visual resources and visual impacts from the standpoint
23 of a structure offshore, if you can see it from any -- you
24 know, from shore, and as well as onshore, you know, any
25 related onshore facilities.

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1 DON LOWELL: Well, we recognize that you can't
2 just have the public wander in and out throughout the oil
3 field, and we respect that concern, but we are looking to
4 find a single access that would be the least intrusive to
5 the industry and that would provide the, allow the public
6 to drive their own vehicles up to the north shore.

7 TIM JENNINGS: Thank you for your comment.
8 Yes, Ma'am.

9 KAREN TOLAND: I may have missed this or not
10 read it in the information, not having a chance yet. But
11 what is the projected start through completion date once
12 you go through the permits issuance issues? I just -- what
13 is the projection for completion?

14 TIM JENNINGS: Excuse me for a second. Just so
15 we can have it on the record, we want to get your name
16 again.

17 KAREN TOLAND: Oh, again.

18 TIM JENNINGS: Yes. That way we can keep track
19 of comments and where they came from. That's the only
20 reason.

21 KAREN TOLAND: Okay. Karen Toland. I am a
22 preschool teacher.

23 GARY CAMPBELL: We have a desire to start up
24 late '98, early '99. And that is assuming that the
25 designing can progress the way we have scheduled, funding

1 will be obtained through our London BP board, and also
2 obviously the permitting process comes to successful --

3 KAREN TOLAND: That is when you hope to start
4 drilling?

5 GARY CAMPBELL: No. That is when we hope to
6 start producing.

7 KAREN TOLAND: The drilling would probably start
8 when?

9 GARY CAMPBELL: Probably -- and I say probably
10 because we don't have anything definitive -- probably
11 January of '98, as a guess. I would be tripping over
12 myself if I said anything more than a guess.

13 KAREN TOLAND: Karen Toland again.

14 I am jumping way ahead here again. I just
15 noticed your endangered whale population study maps over
16 here, and I am assuming that, since you are providing this
17 information, that there is a plan providing maybe times
18 when drilling would not be going on during whaling season,
19 or not? Is there --

20 TIM JENNINGS: The data up there is MMS,
21 Minerals Management's survey, Paul's agency. There has
22 been a lot of surveys done by MMS and by the North Slope
23 Borough, including then local, observations by the local
24 people. And MMS has summarized some of the data there.

25 We know from previous public comments on, for

1 instance, some of the MMS offshore lease sales, that the
2 bowhead whale we know is a very important subsistence
3 species and is of great concern to the locals that
4 exploration and development and production and operation,
5 the whole gamut, does not adversely affect their
6 subsistence harvest. For instance, we know that one of the
7 concerns is noise, and the concern is that noise could
8 adversely affect the distribution of whales, pushing them
9 further offshore, meaning local subsistence harvest people
10 would have to go further in order to hunt.

11 GARY HAYWARD: But to answer your question, I
12 think it's probably a little bit too early to say exactly
13 what, if any, restrictions would be placed on drilling. I
14 think that would come out of the EIS process as the EIS
15 proceeds and as we get more and more involved with what
16 their schedule and their activities would be -- their
17 meaning BP's.

18 TIM JENNINGS: Jon.

19 JON ISAACS: I will just say as part of the
20 process of the team working together, we have folks like
21 Sam Stoker here who is working on part of the biological
22 aspects, we have Steve Braund who is working on the
23 subsistence aspects, so we look at this through the
24 effected environment, working with the Native communities
25 up there who will see the consequences, and we have to

1 address the consequences and address what appears to be
2 reasonable mitigation. So this process will look at those
3 issues.

4 TIM JENNINGS: Yes, Ted.

5 TED ROCKWELL: My name is Ted Rockwell.

6 I would also like to add that that's another one
7 of the reasons that the EIS is being prepared, and that is
8 that while we have looked at whales with regard to
9 exploratory activity, seismic surveying and exploratory
10 well drilling, no one has looked at the effect on the
11 whales with full development, full production, where you
12 have a facility that is going to be there and in place. So
13 that's another one of the factors that triggered bringing
14 MMS in on the project, and it's why the EIS isn't simply
15 looking at Northstar, it's looking at oil and gas
16 development in the Beaufort, and particularly Northstar is
17 what triggered it. So we're hoping to have a document that
18 we can use as a baseline to tier off of for future
19 development.

20 TIM JENNINGS: Yes, sir.

21 WILLIAM SACKINGER: My name is William
22 Sackinger. I am president of Obelisk Hydrocarbons Alaska
23 Limited, and for the past 26 years I have been involved in
24 the study of offshore oil and gas development in the
25 Beaufort Sea in my role as a faculty member at the

1 Geophysical Institute. And I retired a year ago and I have
2 taken up the leadership of this small consulting company.

3 My involvement with the offshore Beaufort goes
4 back to 1973 when we first realized from discussions with
5 some of the representatives of the Alaska Oil and Gas
6 Association that eventually there could very well be some
7 offshore oil and gas developments. And we undertook to do
8 an identification of the questions at that time, and we did
9 some research beginning at that time on two very important
10 issues. One was the offshore sea ice movements and the
11 forces against offshore structures and the ice pileup and
12 override problems, and the other was the subsea permafrost
13 and the possibility that pipelines would be buried in the
14 seafloor.

15 So my comments tonight then are technical for
16 the most part, although I have to admit that from 1979 to
17 1983 I was involved in the environmental impact process
18 myself as the manager of 15 physical science research
19 projects sponsored by Minerals Management Service. So I
20 have been on the government side and the university side
21 both here. And I was involved in writing major parts of
22 the synthesis reports for the actual lease sales that we
23 are talking about that leased offshore tracts.

24 You might find a lot of the answers,
25 incidentally, to the questions that have been raised

1 tonight by having a look at those synthesis reports that
2 were prepared in the early '80s at the time of the lease
3 sales.

4 There are some questions that have not been
5 discussed and I don't see on these drawings, and I would
6 like to bring them up for the benefit of the industry
7 people to do some rather focused engineering studies and
8 get some engineering answers.

9 The buried pipeline of course has to withstand
10 the scouring effects of the sea ice. The sea ice ridge
11 keels scrape along the seafloor in the early part of the
12 year and again during the breakup time in the late spring.
13 The depth of the trenches that have been looked at are in
14 that region at least rather shallow, in the range of three
15 or four feet deep, and a 10-foot burial I think looks
16 conservative, but I have to qualify that by saying that it
17 is possible for some wave action to uncover that pipeline
18 because the sediments are fine-grain sediments and wave
19 action and the fall storms might uncover sections of it.

20 So I think there needs to be some provision for
21 armoring the pipeline perhaps with concrete caps or some
22 other kind of armor is one possibility. Another
23 possibility, of course, is to make the wall thickness of
24 the pipeline thicker than is required from the standpoint
25 of pressure design and to use the wall thickness increase

1 as a way of insuring that the pipeline will not be damaged
2 by the arrival of ice ridge keels. This, of course,
3 incidentally, would assist in the problem of long life as
4 regards corrosion.

5 The problem of the pipeline carrying the warm
6 oil coming on to the land has not been discussed. It's
7 true that offshore the diffusion of salt down into the
8 seafloor disbonds the ~~ice-bonded~~ permafrost rather quickly
9 after the sea has advanced upon a particular piece of
10 property, but at the beach itself there is a transition
11 zone, and the critical transition zone is where there is
12 only one or two feet water depth. And the pipeline is
13 expected to somehow make a transition on to land that
14 actually does have permafrost in it, and this transition
15 zone has to be very carefully designed and calculated so
16 that the heat from the pipeline does not thaw the
17 permafrost. In other words, you really have to bring the
18 pipeline out of the seafloor at an offshore location
19 somehow and elevate in the normal manner. And if you do
20 decide to do that, you have to decide how you are going to
21 make the pipeline resist moving sea ice, so there will have
22 to be some clever design work done. I would certainly hope
23 to see that in one or two of the drawings in the draft EIS.

24 Of course, on the island offshore you are going
25 to be creating permafrost, and you also have a problem of

1 how do you make the transition from the pipeline on to the
2 beach of the island. And I would also like to see some
3 drawings in the draft EIS about how that would properly be
4 done.

5 There is another problem about transportation.
6 You know that in the summer you can use a work boat just
7 like in the Gulf of Mexico and in the winter you can use an
8 ice road. In fact I can remember doing measurements of ice
9 stress against Seal Island in the early '80s when the
10 drilling was going on, and I remember being out there at
11 the time when there was a discovery and there was a great
12 flare coming off of the drill rig. I have to say though
13 that in the spring breakup time there are a couple of weeks
14 when you don't have access with either a boat or with an
15 ice road and you have to consider something in addition to
16 a helicopter at that time.

17 There may be an incident involved on the island
18 at that time where you are going to have to move heavy
19 freight of some sort to the island and you are going to
20 have to have surface access. The traditional answer, of
21 course, is some kind of hovercraft approach. Similarly in
22 the fall when you have freeze up of the sea ice there are
23 times when the ice is about a foot thick, two feet thick,
24 and it is difficult to get a boat through it. And then you
25 of course haven't built the ice road as of yet, and a

1 hovercraft at that time would also be one of the options.

2 So I might also mention about your beach slope
3 design. It looks like you have taken into account the
4 possibility that there would be fall storms that would
5 produce breaking waves that would actually impact against
6 the island. Breaking waves, of course, can be of serious
7 height. In that particular location you might find 12 to
8 15 feet high waves. Such an event actually did take place
9 several years back and it damaged the Tarsuit structure in
10 Canada. And there are plenty of records in Canada about
11 that storm. So you have to take into account the breaking
12 wave height plus the storm tide height at that location.
13 And my rough calculations show me that if I add those two
14 numbers up, it looks like you still have about six or seven
15 feet of margin on your freeboard of your island, so I think
16 I will congratulate you on doing that design.

17 The backfill over the pipeline is always a
18 question because it not only affects the resistance of the
19 pipeline to the scour of the ice but also the heat transfer
20 from the pipeline can be affected. If you have a ~~cearse~~
21 backfill, of course, there can be conductive heat transfers
22 through the coarse sediments and this can perhaps minimize
23 the melting problem if you are using coarse sediments or a
24 coarse backfill on the beach transition region.

25 This question of trenching to install the

1 pipeline is a tricky one because backhoes that can dig down
2 50 feet below the ice surface are rare creatures. I am not
3 an equipment specialist, but a 50-foot reach downward is, I
4 think, a tough thing to do. Maybe it can be done. I have
5 done calculations about the weight that can be supported on
6 the edge of a trench. We had a problem to deal with in
7 Nome actually along these lines. And the weight that can
8 be supported by a semi-infinite ice sheet with a trench is
9 considerably less than the weight supported on an ice road
10 of ice of the same thickness. So you can't take the number
11 for driving over a seven-foot thick ice road and put a
12 trench in it and expect that you will still be all right.
13 You will have a problem with the loading if you go as heavy
14 as that.

15 I might mention on corrosion, there are some
16 special steels that I have worked on and done corrosion
17 tests with for offshore locations in the Arctic. In fact,
18 we took a whole range of steels and welds of different
19 steels. Of course the steel itself and its corrosion is
20 one problem and then another problem is the corrosion of
21 the weld on the steel, which of course the weld zone has a
22 different composition and a different corrosion property.

23 And we have done some testing by actually
24 immersion testing of a lot of different steel samples in
25 the coastal zone, exactly along the way where this will be

1 installed actually, and we have a report on those test
2 results. The steels that we tested were not very standard,
3 they were somewhat special steels for arctic offshore
4 corrosion prevention.

5 I guess those are my main remarks.

6 I think that in terms of ice, the ice that you
7 are going to run into there will be annual ice and perhaps
8 occasionally multiyear ice. You have to expect that you
9 may see ice floes that are about as thick as the water
10 depth occasionally over the 20 or 30-year recurrence time.
11 But since you have an island as your offshore location, the
12 beach of the island, especially the way you have armored it
13 with concrete, that should withstand any kind of ice
14 pressure problems.

15 On the other hand, if you consider using
16 Molikpaq, then I have an entirely different set of remarks
17 to make. And there is a lot of literature about Molikpaq
18 and what it can and cannot do, and the same for some of the
19 other offshore structures in Canada that have actually been
20 deployed, been tested, been instrumented and so forth. My
21 library is filled with many, many volumes of results from
22 those tests, and not all are confidence-building results.

23 TIM JENNINGS: Can you define Molikpaq for the
24 people who may not know what that is.

25 WILLIAM SACKINGER: Okay. Molikpaq is a special

1 steel caisson-style artificial island that was used in
2 Canada. The best way to think of it is it's a kind of ring
3 of steel and then it has been filled on the inside with
4 sand. And it's actually something like, the diameter is
5 something like a football field in diameter. And it was
6 successfully used to drill offshore exploration wells in
7 the Mackenzie Delta area.'

8 There was one particular incident that has been
9 documented in the literature where multiyear ice was
10 pushing against it and it began to vibrate. And it did not
11 fail but the people that were there were very worried about
12 having it fail. So we may have reached a real experiment
13 where we are quite near the design limits on that
14 structure.

15 That is not to say that it wouldn't work in this
16 location because the ice severity in this location is much
17 less than it is in the Mackenzie Delta area of Canada.

18 And I also should mention that the CIDS,
19 concrete island drilling system, that was used here has
20 been sitting there for quite some time and withstanding ice
21 movement successfully.

22 So offshore structures, artificial structures,
23 can be made to work well, but there are some -- some work
24 better than others.

25 I think I have given you some food for thought,

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1 and I think I have covered most of the items that I had
2 sketched down to speak about. And so I would like to call
3 my remarks to a close right here. And I hope the record
4 has been able to take that all in so I don't have to try to
5 write it all down later.

6 TIM JENNINGS: We have it two different ways.

7 WILLIAM SACKINGER: Thank you.

8 TIM JENNINGS: Thank you.

9 GARY HAYWARD: Could you repeat your company
10 name again, please.

11 WILLIAM SACKINGER: The company name is Obelisk
12 Hydrocarbons Alaska Limited, and the address is 669 DePauw
13 Drive, Fairbanks, Alaska, 99709.

14 TIM JENNINGS: While we are waiting for the next
15 person, if anybody wants to take a stretch break, there are
16 some cookies in the back.

17 Is anybody else intending to comment?

18 Before we break up, I want to ask one more time
19 here, does anybody else intend to provide some comments for
20 the record? If not, I would like to put a wrap on it
21 formally. We can spend as much time as you would like
22 informally to continue discussion after the meeting.

23 I would like to say thanks for coming, taking
24 time out of your busy lives and schedules to come and share
25 your ideas with us. To keep you updated in the future,

1 anyone who signed in with a legible address, you will be
2 added to our mailing list and will start receiving in the
3 future updates as we prepare them by newsletter on this
4 project in the EIS process for the Beaufort oil and gas
5 development and Northstar.

6 I want to mention the comment card, the green
7 card that you may use to provide us with additional written
8 comments during scoping. We would like to have scoping
9 comments by May 30th in order that we can move forward with
10 the draft EIS process. We also have a toll-free 800 number
11 at the Corps of Engineers to reach Terry or myself.

12 And once again I would like to say thanks for
13 coming. If any of you would like to spend some time
14 afterwards continuing your discussions informally, we will
15 be available to do that.

16 (Proceedings concluded at 9:20 p.m.)
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REPORTER'S CERTIFICATE

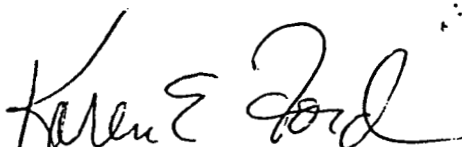
I, KAREN E. FORD, Registered Professional
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Alaska Stenotype Reporters and Notary Public for the State
of Alaska; that the foregoing proceedings were taken by me
in Stenotype Shorthand and thereafter transcribed by me;
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record of said proceedings taken on the date and time
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Further, that I am a disinterested person to
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IN WITNESS WHEREOF, I have hereunto subscribed
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KAREN E. FORD, RPR
NOTARY PUBLIC, State of Alaska

My Commission Expires July 13, 1999.